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**The Experience of the Japanese-Chinese War and of the Spanish Civil War
for the Development of the German "Blitzkrieg Doctrine" and its Lessons
for the Transformation Process**

**A Monograph
by
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German Army



**School of Advanced Military Studies
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Abstract

The Experience of the Japanese-Chinese War and of the Spanish Civil War for the Development of the German "Blitzkrieg Doctrine" and its Lessons for the Transformation Process. By Col (GS) Rainer Waelde, Germany, 52

This monograph examines the transformation of military forces, the development of military doctrine and the influence of previous wars. It is an attempt to identify the driving factors of military transformation in general, to look into the role minor wars are playing in this process and to see whether there are constants of warfare, which are valid over a longer period of time within an otherwise rapidly changing environment. The thesis of the paper is that major wars determine the general direction of military change and minor military clashes are used to validate the direction.

The role of military history in general is described and a theoretical model for military transformation based on organizational respective institutional theory and the balance-of-power-theory is developed. The monograph explains the factors influencing military transformation and its relationship to previous wars. In this context the relations between doctrine, concept, and strategy are laid down and the role of doctrine in the planning process – force planning and operations planning – is examined.

The theoretical model and its explanations is then examined and evaluated at the example of the German "Blitzkrieg doctrine" (lightning war) and its development in the interwar era. The "Blitzkrieg doctrine" has been chosen because it is said to constitute a nearly perfect transformation of military forces. The influence of the Civil War in Spain and the Japanese war in China on the development and modification of this doctrine between 1935 and 1939 is of special interest, because such "minor military clashes" are often said to be used as a medium to shape the military means. The principles of the "Blitzkrieg doctrine" are identified; the factors, which influenced the doctrine and the overall environment in which it emerged, are described.

In this context five factors of general validity for warfare are identified. The principles of concentration of forces at the decisive point, maneuver and mobility of forces, flexibility, leadership and initiative, and orchestration and coordination of the various forces found their origin in Prussian warfare during the Napoleonic era and were further developed in World War I. They provided the mental basis for the "Blitzkrieg doctrine," which cannot be called a doctrine from a formal point of view. These principles were neither contradicted by the Civil War in Spain nor by the Japanese Invasion in China in the Thirties of the last century. They seem to be valid even in the future under the conditions of network-centric warfare.

To understand the ongoing transformation process the interests of the political and military leaders are critical. Because the development of military doctrine is more an evolutionary than a revolutionary process, military change should follow the tradition of the institution. For the U.S. Army this means to further concentrate on technological advance and on individual training and leadership. Minor military clashes, if carefully evaluated and if the results were validated in war games and high level exercises, they may serve as a milestone to check the direction of the transformation process.

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CHAPTER ONE

INTRODUCTION

When the electric light replaced candle and gaslight, and when the automobile substituted horses as means of transport, human life transformed. The invention of gunpowder, the introduction of the machine gun onto the battlefield and the use of battle tanks transformed military forces and their employment. Before World War I, the major European nations were convinced that fast offensive military operations would result in a decisive and rapid victory. The reality proved to be different. Before World War II nations living in a similar technological environment came to different views with regard to future war fighting. Only Germany seemed to have understood the possibilities the development of battle tanks provided to modern warfare. It lost the war.

After a period of a relative continuous development of traditional military forces especially during the last phase of the Cold War era, once again we are faced with the challenge of a supposed radical transformation of military forces in an apparently revolutionarily changed political and technological environment. Once again, only the next real military clash will show whether the right consequences shaping the armed forces have been drawn. We cannot just wait and see. To the contrary we should use all means available to adapt the military to the requirements of today and to prepare it for tomorrow. To change military forces we should be aware of the mechanics of military transformation and the role experience of previous wars is playing in the process. "As proven in the war" may be the highest quality judgment.

Experience of War – a Driving Factor for the Transformation Process?

"We have to think differently," President Bush said. "The enemy who appeared on September 11 seeks to avoid our strengths and constantly searches for our weaknesses. So America is required once again to change the way our military thinks and fights."¹ With these words President Bush renewed his

¹ President Bush, speaking December 11 at the Citadel in Charleston, S.C., Jim Garamone, "Bush calls for military transformation," *The Journal* [Journal on-line] (20 December 2001, accessed 15 November 2002); available from <http://www.dcmilitary.com>; Internet.

willingness to change the military. In his campaign for office, he had called for the transformation of the military into a leaner, more agile "Information Age" fighting force.²

Secretary of Defense Donald Rumsfeld is also advocating a culture of change, flexibility and adaptability for the members of the Armed Forces. To illustrate his ideas of transformation in November 2001 he told the students at the National Defense University about the battle of Mazar-e Sharif in Afghanistan during a speech. The American soldiers rode into battle on horseback alongside their Afghan allies. They found targets and radioed to waiting U.S. Navy and Air Force pilots who used precision-guided munitions to bomb Taliban and Al Qaeda positions. What won the battle of Mazar-e Sharif according to Rumsfeld was a combination "of the ingenuity of the U.S. Special Forces, the most advanced, precision-guided munitions in the U.S. arsenal delivered by U.S. Navy, Air Force and Marine Corps crews, and the courage of valiant one-legged Afghan fighters on horseback." The mixture of horse cavalry and high-tech weaponry is what the idea of transformation of the military is all about according to the Secretary of Defense. He cited the German innovations that led to the "Blitzkrieg doctrine" (lightning war) as an example of transformation. The German army that overwhelmed France and drove Britain to the sea in 1940 took existing weapons and used them in new and transformational ways. The same could be said for the battle of Mazar-e Sharif.³

But Secretary Rumsfeld was quick to caution the audience of senior military officers and senior government civilians not to lock themselves into the battles in Afghanistan as the general model of future warfare. As after every military clash, the question for those who bear responsibility for the security of their nation, politicians and military is what conclusions can be drawn in order to shape the military to cope with future challenges.

² President Bush during a September 1999 visit to the Citadel in Charleston, S.C., Ronald Brownstein, "Success in Afghanistan Clouds Military Transformation," *Newsday.com*, [journal on-line] (2002, accessed 15 November 2002); available from <http://www.newsday.com/templates/misc/printstory.jsp?slug=la%2D121201assess§ion=%2Fnews%2Fnationworld%2Fnation>; Internet.

³ Secretary of Defense Donald Rumsfeld in an address to the National Defense University at Fort McNair, 31 January 2002 in Washington, Jim Garamone, "Flexibility, Adaptability at Heart of Military Transformation," *American Forces Press Service* (Washington, 1 Feb 2002, accessed 15 November 2002); available from <http://www.defenselink.mil/afis/editors/>; Internet;

This paper examines the transformation of military forces, the development of military doctrine and the influence of previous wars. It is an attempt to identify the driving factors of military transformation in general, to look into the role minor wars play in this process and to see whether there are constants of warfare which are valid over a longer period of time within an otherwise rapidly changing environment. The thesis of the paper is that major wars determine the general direction of military change and minor military clashes are used to validate the direction.

After a general description of the role of military history, chapter two posits a theoretical model for military transformation on the basis of organizational respective institutional theory and the balance-of-power theory. It explains the factors influencing military transformation and its relationship to previous wars. It also discusses the influence of other factors driving the transformation process such as technological developments, political, economic interests, and social influences. In this context the relations between doctrine, concept, and strategy have to be clarified and the role of doctrine in the planning process – force planning and operations planning – is examined.

In chapter three the theoretical model and its explanations will be examined and evaluated. The example of the German “Blitzkrieg doctrine” and its development in the interwar era is chosen because it is said to constitute a nearly perfect transformation of military forces. The influence of the Civil War in Spain and the Japanese war in China on the development and modification of the doctrine between 1935 and 1939 is of special interest because such “minor military clashes” are often said to be used as a medium to shape the military means.⁴ The principles of the “Blitzkrieg doctrine” are identified; the factors, which influenced the doctrine and the overall environment in which it emerged are described. It is important to determine whether or not there are general factors that can be identified, which were valid in warfare during World War I, in military clashes thereafter, and in World War II. If the latter can be affirmed this might be an indication of the existence of factors valid even today.

Chapter four draws conclusions regarding the current transformation process in the U.S. Army. The

⁴ See for example Bryan Perrett, *A History of Blitzkrieg* (New York: Stein and Day, 1983), 68: “The Spanish Civil War had provided an opportunity for modern theories of war to be tested...”

existence of general factors and their importance for military transformation in the post cold war era are expounded and the driving factors behind the ongoing military transformation process are uncovered. This will allow to identify the differences in the present transformation process of the U.S. and the German Army. At the end of the paper general advice for military transformation in a rapidly changing environment is formulated.

Role of Military History

Learning from history does not mean to look at a checklist and to find the right answer for a certain problem. History is the result of a unique chain of circumstances, causes and results of the past. As such it does not follow laws and rules.⁵ History is not able to provide a recipe for action in the future, but it can enlighten a certain situation. Before learning from the past we have to recognize that the writing of history has always been subjective⁶. There has always been a danger of covering facts with a haze of individual interests and personal experiences. This applies especially to the military history written on the so-called German "Blitzkrieg doctrine" of World War II.

Nevertheless, history lays the basis for our present thinking and acting. It constitutes the relationship between the past and the present that has to be reflected on by responsible people in order to orient their future activities.⁷ Responsible action, which is directed into the future, has usually been based on history and the virtual experience derived from it.⁸

Military history fulfills three functions: First, it supports and promotes the intellectual flexibility necessary to prevent locking oneself into closed schemes of thoughts and routine of solutions. Secondly, on the basis of scientific methodology it also provides information and explanations about how to develop the military within society. Finally, military history as a normative science also serves the

⁵ Günter Roth, *Politik und militärische Macht* (Potsdam: Militärgeschichtliches Forschungsamt, 1995), 4-6

⁶ Sebastian Haffner, *Im Schatten der Geschichte*. (Stuttgart, 1985), 11

⁷ Günter Roth, foreword to *Grundzüge der Militärgeschichte, historischer Überblick*, Band 1, by Karl-Volker Neugebauer, ed. (Freiburg: Rombach Verlag, 1993), 8

⁸ See Carola Reardon, *Soldiers and Scholars* (Lawrence, KS: University Press of Kansas, 1990) with an extensive discussion on the use of military history in the U.S. Army between 1865 and 1920

military profession with adequate studies of the principles of war and their applications in previous battles, campaigns, and wars. This allows understanding of the political ends and military means and their relationship in a certain circumstance, to practice valid principles and to develop new concepts and doctrines. As such military history serves as a laboratory for military sciences.⁹ Thus Clausewitz claimed ends and means to be exclusively examined from experience of war that is to say from military history.¹⁰

Understanding the German "Blitzkrieg," its doctrine, and the driving factors behind the doctrine, may help to clarify the mechanism of the transformation process, its players and its alternatives. The research of this historical event can improve the ability to understand, to assess, and to act in the present for the future.

⁹ After World War II the relationship between the military and the German society as well as the political leaders has been the focus of military history. Only in the last few years military history has become aware of its function as military laboratory.

¹⁰ Carl von Clausewitz, *On War*, trans. Michael Howard and Peter Paret (Princeton N.J: Princeton University Press, 1976), 144.

CHAPTER TWO

THE MILITARY TRANSFORMATION PROCESS

Transformation constitutes a broad, sweeping change. It is the kind of change that affects the way we live, think, work, play -- and even the way we fight. Such sweeping change has affected the military throughout its existence. Towards the end of the 19th century in the U.S., the army of the civil war was transformed to an army ready for expeditionary tasks. Then the army was transformed into a motorized organization to be able to conduct fast and decisive operations in World War II. Under the dominance of nuclear weapons we saw an adaptation of conventional forces in a new strategic environment. The experience of the Vietnam War, a major shift in American defense policy and a relative decline in the Army's budget reinforced a push forward towards an army prepared to fight a war under traditional circumstances in the European theater.¹¹

So transformation seems to be a normal state of affairs within military forces as it is in every organization. Why does transformation of the Army play such a dominant role for military experts in the U.S. at present? Why does the President demand a radical transformation of military thinking and fighting? Is the present situation comparable with the situation in Germany between both World Wars? Military doctrine and the way it is developed are central to these questions and the transformation process.

Military Doctrine

Political scientists have discussed two principal models to explain military transformation. First, there is the organizational theory, which holds that transformation is the result of conflicting pressure groups within an organization following a bureaucratic process.¹² The balance-of-power theory as a

¹¹ Paul H. Herbert, "Deciding what has to be done," *Leavenworth Papers Number 16*, Fort Leavenworth, 1988, 5-9; Martin van Crefeld analyzed the challenges of complex armed forces for the command system after 1945 and during the Vietnam War. See Martin van Crefeld, *Command in War* (Cambridge, Mass.: Harvard University Press, 1985), 232-260

¹² Barry R. Posen, *The Sources of Military Doctrine* (Ithaca, N.Y.: Cornell University Press, 1984), 34

second school holds the opinion that changes in security policy and military doctrines are the result of external political factors. Military organizations have to balance an external threat.¹³ For both theories military doctrine plays a central role. It affects the security perception of other states as well as it affects the security of any particular state.¹⁴

Military policy is part of the nation's Grand Strategy that comprises all means available, from military, to economic and even cultural means. Military doctrine transfers the military portion of Grand Strategy into military categories. Military doctrine is part of the national security policy and should be under civilian control. It deals only with means and provides an answer on what means are necessary and how they shall be employed.¹⁵ It lays down the ideas of how to fight on the operational and tactical levels of war. According to Diana Bockar who researched the relationship between national policy and military doctrine, "a doctrine can never be merely an idea on paper of how men and machines would fight. The idea must be translated in an actual fighting organization. That means also it is strongly related to the structure of forces and to the equipment available."¹⁶

It is contentious whether a doctrine has to be a written document or only a generally accepted idea and whether it has to be officially approved. The importance of doctrine for training, education and conduct of operations and the complexity of modern military organizations suggest that doctrine in general, is a written document and should to be approved by the highest military leaders.¹⁷

Doctrine is flexible and provides only general principles. It cannot be understood as the only way to

¹³ For more details see Jack Snyder, *Ideology of the Offensive: Military Decision Making and the Disasters of 1914* (Ithaca: Cornell University Press, 1984)

¹⁴ The latter is the case if a military doctrine does not properly reflect the objectives of the grand strategy. There may be doctrines, which are perceived by other nations as being offensive. Though they were initially intended to improve the security of the originating state they heightened the probability of a conflict overall. For more details see Deborah D. Avant, *Political Institutions and Military Change* (Ithaca, N.Y: Cornell University Press, 1994), 4

¹⁵ Barry R. Posen. *The Sources of Military Doctrine* (Ithaca: Cornell, 1984), 13

¹⁶ Diana Bockar, *National Policy and Military Doctrine: The Development of a Nuclear Concept of Land Warfare, 1949-1964* (Ph.D. diss., Columbia University, 1985), 16

¹⁷ This poses also the question of the prescriptive notion of doctrine. In general, a doctrine, especially when officially approved on a high level and existing in form of a written document has the claim for obedience.

fight and should not have to be followed under all conditions. A strict interpretation would meet Clausewitz's criticism on doctrine. Due to the nature of war as an interaction between human beings and due to the frictions of war, Clausewitz came to the conclusion that an inflexible doctrine would be unattainable and therefore could not be applied.¹⁸

Doctrines are instruments to achieve national policy objectives. That means they are by definition means to achieve ends. Ideally, a doctrine itself should have no impact on politics. Doctrine has a purely serving function. It is of no own value and should not become sacrosanct. If the ends change, the means should be adapted accordingly. Thus doctrine is in general flexible.

Having said that, our understanding of doctrine should be a broad one.¹⁹ There should be room for interpretation. This means that controversial thoughts and thinking about a tactical or operational problem are generally necessary and highly welcome. It is a postulate for critical and independent military thoughts. Room for interpretation and flexibility to act gives every commander on the one hand a greater responsibility but requires on the other hand a climate of trust within the organization. A broad understanding of doctrine implies flexibility. Flexibility means that a doctrine is a sort of "living document." It does not have to be formally changed in response to every change in the environment.²⁰

This brings us to the role of military doctrine in the transformation process. There is a position that military doctrine initiates the transformation process. General William E. DePuy, first commander of the U.S. Army Training and Doctrine Command (TRADOC) in 1973, was responsible for the development of *Field Manual (FM) 100-5, Operations*. In it he foresaw five functions of this first doctrinal statement after the Vietnam War. It had an integrating function in an increasingly complex military organization. It

¹⁸ Carl von Clausewitz, *On War*. (Princeton: University Press, 1976), 140

¹⁹ The broad understanding of doctrine has impact on training and education of military personnel. The broader your understanding of military doctrine and the less restrictive a doctrine is applied the more must military leaders be put into position to use the room for interpretation of the doctrine in accordance with a given situation. This means not only that the officer must be trained very well to understand the doctrine. Even more important is the education of the military personnel. All commanders, at every level of command, must have a common understanding of the doctrinal principles and a common language. For more details see Diana Bockar, *National Policy and Military Doctrine* (Columbia, 1985), 43

²⁰ Huba Wass de Czege provides an extensive elaboration about doctrines as a principle and not as a checklist. See Huba Wass de Czege, "On Keeping Ideas Ahead of Technology" (SAMS reprint 2002, document available)

was to provide a general concept of warfare that prescribes the changed Army's focus from dismounted infantry operations to armored operations. It was designed to pull the Army away from its preoccupation with the Vietnam War. Further, it had to rationalize training and future design of material. And finally it had to be a practicable manual not an abstract theoretical document.²¹

After the experience of the U.S. Army in Vietnam, the real purpose of the new fundamental doctrine for war fighting was to force the Army as soon as possible into a new direction. So it was obvious that the doctrine could not have left any room for interpretation. But as the manual had been distributed a broad discussion about its content started throughout the Army. As a result, the doctrine, which was intended to provide guidance for an extended period of time, was replaced in 1982 by a completely revised manual.²²

This doctrine also had to provide the basis for weapons procurement. But according to William J. Gregor, Professor of Political Sciences at the School of Advanced Military Studies in Fort Leavenworth, military doctrine only deals with the employment of available assets and capabilities. It is not concerned with future equipment. It only provides guidance for the operations planning process and cannot be the engine that drives the transformation process. In this regard doctrines have to be distinguished from concepts. Concepts will only become doctrines once tested, approved, and accepted. As William J. Gregor showed, concept and doctrine have been mingled within Army documents throughout the recent years.²³ This was one of the reasons why the 1976 *FM 100-5* failed.

As already stated a doctrine should be broad enough to incorporate technical developments. It should not be a pure description of warfare in the past. It is generally open for the future but it is principally not able to provide the basis for force planning and therefore cannot constitute the decisive document for weapons procurement in the future.

²¹ Paul H. Herbert, "Deciding what has to be done," *Leavenworth Papers Number 16*, Fort Leavenworth, 1988, 1

²² *Ibid.*, 93, 98

²³ William J. Gregor, "The Relationship between Joint Doctrine Development and ServiceDTLOSM" (unpublished Information Paper, 13 January 2003, SAMS Distribution, document available), 2

To summarize, a military doctrine translates the military part of the grand strategy into an overarching picture of how to fight a war. It includes the tactical and operational levels of war and is approved by the highest military or civilian authorities. Military doctrine provides the basis for operations planning and training and is open for changes in the environment. But this means also that not every change in equipment or technology has to result in a new doctrine.

A Theoretical Model of Military Transformation

Although not every change of technology will result in a new doctrine, technological progress plays an important role in the transformation process. As already mentioned there are in principle two general theories to explain the development of military doctrine and change in military organizations.

Organizational theory provides an excellent view on the inter-organizational process to transform an organization. But on the other hand it is not able to explain the influence of international configurations on the transformation process. Here the balance-of-power theory has earned its merits. While organizational theory provides a pessimistic view for military change, the balance-of-power-theory is a very optimistic theory.²⁴ Institutional theory as part of organizational theory tried to overcome these disadvantages.

According to institutional theory, the structure of the political system influences the military change process.²⁵ Decision-making in a system with division of power is based on compromise. Since compromises tend to be conservative and take time, a system of balance-of-power is less amenable to

²⁴ See for the detailed discussion of organizational theory: Deborah D. Avant, *Political Institutions* (Ithaca: Cornell, 1994), 4 – 20: Organizational theory provided a rather skeptical view of military transformation. Because members of military organizations are concerned with resources and the social status of their organization and are caught and fascinated by procedures of the organization they are not able to respond adequately to adapt the doctrine to the security objectives of the nation. As a consequence military change occurs only when the military is forced to change by the civilian leaders.

For the balance-of-power theory see Barry R. Posen, *The Sources of Military Doctrine* (Ithaca: Cornell, 1984), 59-69: It generally suggests that the states will balance one another in the international system. The value with regard to the transformation process is limited because the political responsible leader will react on changes in the international constellations with adequate changes in the own security policy and will cause the military to a respective change in its issues. A detailed discussion of the balance-of-power theory (and of organizational theory) is provided by Posen. See Barry R. Posen, *The Sources of Military Doctrine* (Ithaca: Cornell, 1984), 59-69

²⁵ Deborah D. Avant, *Political Institutions* (Ithaca: Cornell, 1994), 10

change than a system without. These compromises have to be in accordance with the expectations of the voters.²⁶

In highly developed social societies, problems can neither be solved by a vote of all members in practical terms, nor does the sum of individual decisions constitute a meaningful outcome under all circumstances. This compels the political elite to delegate authority to experts to make these decisions on behalf of the society. This is the case between the patients and the doctor, between the citizens of a state and their elected leaders, and between the elected leaders and the administration. Complexity of societies and division of labor lead to a contract between an authority and a respective agency.²⁷

The creation of agencies establishes new players to participate in the political and social field. These new actors, in our case the military leaders, may represent their own organizational objectives and agendas. The military organization as an agency for security has the tendency to develop aims and objectives, which may not always be in accordance with the will of the political leaders. The way that this security agency is controlled by the civilian leaders influences its climate. The climate has an important impact on the internal reaction of an organization and its will to transform. This decision has been generally dominated by the electoral calculations of the political leaders with regard to the respective pressure group. To be elected is the necessary prerequisite for all decisions and actions.²⁸

²⁶ If political authorities in a system with more than one civilian authority found agreement on how the military system has to be constructed this will always happen on the bases of a compromise. Compromise is then a constitutional matter of fact. That means compromises have also been found during the existence of the so constructed military organization, which doesn't favor a climate of change where sometimes unpopular and risky decisions have to be taken. Thus a system of balance of power tends to complicate military transformation in comparison to a system where the power is concentrated in the hands of a dictator such as Hitler in Germany before World War II. But on the other hand civilian involvement and directive are more likely and are more decisive in a non-democratic system. An additional factor of influence is the fact of elections and the uncertainty of their outcome. Politicians and political parties tend to organize agencies in a matter to conserve their influence even after a lost election. That will say that change of the agency will be only possible under a tremendous endeavor.

²⁷ Deborah D. Avant, *Political Institutions* (Ithaca: Cornell, 1994), 5

²⁸ Deborah D. Avant, *Political Institutions* (Ithaca: Cornell, 1994), 6: Military change is also dependent on the incentives given to the actors. If for example the transformation of the army allows its rapid and short employment and further on minimizes the probability of own losses this would mean additional power for the political responsible e.g. the president and would constitute an important incentive for him. The interaction between the civilian leader and the military organization influences the culture or climate of the military organization and as such the willingness and direction of change.

Additionally, the system of incentives granted to military leaders by their civilian superiors influences the internal climate. Incentives, standards of training, and objectives for education promote the commonality of the military organization and form its culture. The culture itself is a major factor for military change.²⁹ An organization which has dedicated vast parts of its policy towards transformation and which rewards its members for contributions to change will react different from one where members with a positive attitude to change are not promoted with the same speed as traditionalists.

In this context military leadership plays an important role. Research shows that under certain conditions military leadership had a greater influence on the transformation process than control and overview by civilian leaders. The right man at the right time at the right place can decide upon the direction and speed of change. The influence of the leader is especially high in military organizations where loyalty is of great value.³⁰

There is another internal factor which influences the process of military change. For effective transformation, a minimal organizational precondition should be fulfilled. The will and the mental preparedness of the individuals to adapt an institution is a necessary prerequisite to change. For effective transformation it should be supported by adequate organizational structures.³¹

In addition there are other factors, which influence military change. Geography, threat and technology must not be ignored. The relationship between technological developments and new weaponry on one hand and military transformation and the development of new doctrines on the other hand brings us to the chicken-and-egg-question: what was first, the doctrine demanding for new weapons or new weapons demanding for doctrinal change.³²

²⁹ Ibid., 15

³⁰ For the importance of the individual see James S. Corum, *Hans von Seeckt and German Military Reform. The roots of Blitzkrieg* (Lawrence, KS: University Press of Kansas, 1992): He provides a detailed assessment of von Seeckt's influence on the development of the Blitzkrieg doctrine.

³¹ See Deborah D. Avant, *Political Institutions* (Ithaca: Cornell, 1994), 11: She describes how the design of a military organization can influence the ability of military change.

³² The Germans looked for new doctrines to overcome the standstill of warfare in the Great War. Great Britain looked into the possibilities modern technology could provide with the construction of the battle tank. In the following period it was obviously a process of trial and error between the development of the battle tank and the

In accordance with Posen, new technology seldom serves as a catalyst for doctrinal innovation. More often, new weaponry is implemented in the environment of an old doctrine. Within the process of trial and error the use of weaponry will be changed and doctrine adjusted.³³ There is no law that states that a certain technological change will allow only one special doctrinal approach, nor is there a rule that a special weapons system can only be employed in a certain way and therefore demands one special doctrine.³⁴

The overall political situation, the capabilities of opponents as well as geographical factors also influence the transformation process. The unexpected appearance of a military threat accelerates the military change often initiated by the civilian leader. Nations with natural barriers around their territory such as Switzerland, the United Kingdom and the United States, will react different to technological developments than nations without natural barriers such as Germany.³⁵

Major wars have tremendous impact on military change and its general direction. They provide the possibility to compare strategy, doctrine, weapons systems and human performance of various nations under generally the same conditions. After being thoroughly evaluated, they are able to give a strong incentive for change. Minor military clashes are used to validate the direction of change as a step between major wars. Because of their principally special conditions with regard to terrain, or duration,

development of the respective doctrine. One could say the Germans had the doctrine and looked for the adequate weaponry whereas Great Britain had the battle tank but an inadequate doctrine.

³³ Barry R. Posen. *The Sources of Military Doctrine* (Ithaca: Cornell, 1984), 53-56

³⁴ The time between World War I and World War II may be used as an example. Whereas France drew the conclusion that firepower will be the dominant factor, Germany put the main emphasis on movement and maneuver. Thus there were different doctrines of how to employ the tank weapon. The limited influence of new weapons on the process of doctrinal change can be agreed upon. But it has to be modified when speaking about the general technological development. Main technological developments as in the field of communications and transport before the Great War initiated a change in or at least an adaptation of military doctrines. Especially in critical situations, civilian leaders tend to press the military into a transformation process in order to adapt to the technological development. This was the case in Germany during World War II when Hitler looked for the weapons, which were able to provide a miracle and win the war, and it was the case with Saddam Hussein and weapons of mass destruction.

³⁵ Following this argument a certain geo-strategic situation can heavily influence the development of a special doctrine and demanding the development of special weaponry. The first will more likely tend towards a status quo and a defensive strategy. The latter will tend to change and towards an offensive strategy. But under the light of the availability of strategic transport and long-ranging and precise weapons, this thesis seems to be no longer valid.

objective, or participation, they can only provide partial experience on single matters of interest. The conditions in the "laboratory" are not suited to draw general conclusions.

To summarize, adaptation of military doctrine and the transformation process are especially influenced by the structure of the overarching political system, the personal interest of the leaders and their respective pressure groups, the culture of an organization, the geo-strategic situation and the speed and extent of global technological change. Last, but not least, transformation depends on the existence of a strong personality. Experience of war influences the above mentioned factors in general terms. Major wars provide a starting-point. Minor wars serve as a laboratory to prove the further developed doctrine and material.

CHAPTER THREE

TESTING THE MODEL

When Germany conquered Poland in 1939 and overran France in 1940, its success was possible only because of the "Blitzkrieg doctrine." The development of this doctrine after World War I and the influence of two minor military clashes will be used to test the theoretical model of military transformation.

The German "Blitzkrieg Doctrine" and its Principles

The expression "Blitzkrieg" or "lightning war" has become a general term. In accordance with Bryan Perrett it is used for an especially effective and efficient way to perform an offensive action in war. It is normally applied to ground warfare.³⁶ Three remarks may be allowed at this early point. First "Blitzkrieg" does not normally refer to a war but to one or more campaigns. So World War II cannot be termed "Blitzkrieg," but the campaigns against Poland and France in 1939 and 1940 respectively are usually referred to as "Blitzkrieg." Secondly, the reference to land warfare has to be reconsidered. Besides armor, airborne operations and airpower also constitute components of the "Blitzkrieg." We have finally to notice that this expression was never used in the German army of those days.³⁷

The features of "Blitzkrieg" are swiftly conducted strikes with locally superior forces in unexpected places and with enormous violence. That means a continuous concentration of forces and their relocation and concentration again in other places. As such it constitutes a sequence of strikes. A first success has to be swiftly exploited without taking care of open flanks. Fast operations and continuous movements are seen to be the best protection against counterattacks. The thrust is not directed against the enemy's point of main effort but against his lines of communications in his rear. The idea is to take the indirect

³⁶ Bryan Perrett, *A History of Blitzkrieg* (New York: Stein and Day, 1983), 11

³⁷ Ibid., 69. See also Matthew Cooper, *The German Army 1933 – 1945* (Chelsea: Scarborough House, 1978), 115

approach and to destroy the enemy by confusion. The bases for such operations are flexibility with regard to structures, and intellect as well as aggressiveness and mobility of forces.³⁸

There were certain unique factors in Germany that influenced the development of this doctrine. As Cooper stated, the traditions of the Reichswehr and Wehrmacht provided a sound base, especially the ideas of von Moltke and von Schlieffen with the principle of decisive maneuver.³⁹

One person especially influenced the development. Hans von Seeckt, the Chief of the German General Staff from 1919 to 1920 and Commander of the German Army from 1920 to 1926 had a tremendous influence. He was shaped by his experience at the eastern front during the Great War with its wide space and possibilities to maneuver. He initiated a very comprehensive examination of the experiences of the Great War and its consequences for military structures, doctrine and training.⁴⁰

Among others, more than 400 general staff officers were involved in the examination of World War I experience. Their work resulted in *Army Regulation 487 "Leadership and Battle with Combined Arms"* which appeared in two parts between 1921 (part I) and 1923 (part II). This fundamental document provided the base for training and exercises. It was guided by the emphasis of offense even under a strategically defense and the dominance of maneuver over firepower. Lower command levels played a

³⁸ There was nothing revolutionary at the "Blitzkrieg doctrine". Only the consequent combination of the various principles and their appliance by a well-trained force and the idea of deep operations with open flanks, the "armored idea" were really new.

³⁹ Matthew Cooper, *The German Army* (Chelsea: Scarborough House, 1978) 119: The individual honor and pride inherited from the Prussian King Frederick the Great inspired the courage under fire. The Prussian reformers under Scharnhorst provided the intellectual bases for critical thinking on the one hand and discipline and subordination on the other hand as well as the emphasis on thorough training as prerequisite for success in battle. And last, but not least, there was the influence of the military thinking of von Moltke and von Schlieffen with the principle of decisive maneuver. It aimed at the total destruction of the enemy through massive encirclement of his forces, and the acceptance of new developments in weapons and machines in the achievement of that aim. Although it was in the German military tradition to put the emphasis on maneuver and the implementation of new technology this heritage certainly did not exclusively direct the German army to the "Blitzkrieg doctrine".

⁴⁰ See James S. Corum, *Hans von Seeckt and German Military Reform* (Lawrence, KS: University Press of Kansas, 1992): He provides a detailed assessment of von Seeckt's influence on the development of the Blitzkrieg doctrine. Von Seeckt tried to transmit the tradition of the imperial armies in the Reichswehr. His decision to rely to a great extent on general staff officers seemed to be one of the most important points for the future development. They were not only highly trained in tactical and operational matters as well as in efficient staff work, they were also to a high degree emotionally tight to the traditional military thinking. They constituted an ideal composition of tradition, worth to be delivered and functional and efficient thinking and open mindedness. But most importantly, they were used to not thinking in categories of branches or weapons systems but to look at the army in total.

decisive role in operations. This asked for initiative of the leaders on all levels and underlined the importance of the personal assessment of the local situation.⁴¹

Army Regulation 487 also provided a fruitful ground for discussion within the officer corps. The critical issue was the relationship between armor and infantry. Here General Heinz Guderian was the representative of the radical view. Whereas the field manuals and even the practice in the campaign against Poland and France saw the armor in a supportive function for the infantry as the decisive branch, Guderian asked for independent armored forces in order to deeply thrust into the enemy forces without taking care of the slower advancing infantry and with long open flanks. This dispute between the representatives of the "Vernichtungsgedanke" and the representatives of the "armored idea" was never solved in the German army.⁴²

In 1923 when "Leadership and Battle with Combined Arms" was published, the German Reichswehr did not have any armor or heavy artillery. The Versailles Treaty foresaw a lightly armed German Army only able to guard its borders and care for internal security. The restrictions of the treaty also provided advantages for the future. So the German army was not burdened with high quantities of obsolete material, as it was the case in France, the United States or Great Britain. The lack of material and the

⁴¹ Williamson Murray and Allan R. Millet, *Military Innovation in the Interwar Period* (Cambridge: University Press, 1996); 37-38

⁴² See the discussion in Matthew Cooper, *The German Army* (Chelsea: Scarborough House, 1978), 137: while both ideas tried to avoid attrition and asked for rapid and decisive movement as well as for the concentration of forces at the decisive point there were also important differences with other regard. Whereas the "Vernichtungsgedanke" saw the decision in the physical destruction of the enemy after a coordinated encirclement the armored idea was to paralyze the enemy forces by unsupported deep thrusts. The protection of flanks stood against velocity of movement and a rather centralized control was faced with independence of action. As a consequence the one asked for mass infantry armies and the other for small armored divisions. "Leadership and Battle" (1923) subordinated the armored forces under the infantry forces. But officers with influence and parts of the general staff (then *Truppenamt*) saw tank units as independent units and not as infantry support units. For example von Fritsch (later army chief) and Blomberg (later commander in chief of the armed forces) saw tank units in a more independent role. The decisive field manual for German warfare between 1939 and 1945 "Truppenführung" (Troop Command) of 1933 offered the following solution: "If tanks are too closely tied to the infantry, they lose the advantage of their speed and are liable to be knocked out by the defense". Field manual 300 "Truppenführung" built on "Leadership and Battle with Combined Arms" of 1923 and had room for interpretation with regard to the "Blitzkrieg doctrine". It did not ask for, nor did it prescribe that the "armored idea" is the guiding principle for attacks, neither on the operational nor on the tactical level. See also James S. Corum, *The Roots of Blitzkrieg* (Lawrence: University Press 1992), 131

limited size of 100,000 men paved the way to look onto new developments and on new technology to compensate for the restrictions.⁴³

But the financial resources in Germany were at least as scarce as they were in other nations. Even after 1933 when Hitler came to power there was a continuous struggle with regard to the allocation of resources. Goering's slogan "guns and butter" showed the competition.⁴⁴ In 1939 the German industry was not able to provide the large amount of equipment and material the services asked for with view of Hitler's plans.⁴⁵

The restrictions on the strength of 100,000 men additionally forced the Reichswehr to effectively structure its forces and train and educate the soldiers. The triangular division and the lean headquarters proved to be efficient, the general staff provided the organizational and mental framework for change. With the evaluation of the experience of the Great War and its implementation in the respective field manuals the foundation for training was laid. The systematic exercise cycle provided training for all levels and echelons. Staff exercises and field training exercises alternated. So the Reichswehr became one of the best-trained and educated armed forces in Europe.⁴⁶

As far as the external influence on the Reichswehr is concerned, besides the aforementioned Versailles Treaty and financial restrictions, the geo-strategic situation of Germany in the center of

⁴³ Matthew Cooper, *The German Army* (Chelsea: Scarborough House, 1978), 117

⁴⁴ Ibid., 128

⁴⁵ For more details with regard to equipment see Hew Strachan, *European Armies and the Conduct of War* (London: George Allan & Unwin, 1983), 162 and Matthew Cooper, *The German Army* (Chelsea: Scarborough House, 1978), 155, 156, 162: When Germany went to war, less than 20 percent of all vehicles in an armored division were at least partially tracked and possessed cross-country mobility. In order to create 9 armored divisions, the number of tanks had to be reduced from originally 433 per division to 299. The mobilization of the infantry divisions was even more inadequate. Four infantry divisions were fully motorized in 1939. The other 86 divisions had to rely to a large degree on in the context of mobilization requisitioned civilian trucks and on horses. The 1932 initiated long-term rearmament program was originally not carried out with priority. The equipment with the PzKw III as the main battle tank proceeded only slowly. And even in 1939 the production of the advanced PzKw IV had been slowed down so that only 45 were handed over to the army in that decisive year.

⁴⁶ With the enlargement of the then Wehrmacht to wartime strength of about 3.7 million soldiers this was certainly not the case to that extent. The selection process of officers and noncommissioned officers was not comparable with the one of the Reichswehr. The more the army grew the bigger the problem to realize new ideas and concepts became. And as already mentioned there was a lack of material, equipment, and especially motorized vehicles for an efficient training of the fast growing institution. This has also to be considered with regard to the appliance of a doctrine.

Europe has to be recognized. With view to its own weakness until 1937, the overall strategy was defense in the west and east.⁴⁷ A defense on two fronts could have been accomplished either by static forces and fortifications or by highly mobile forces. The first was not in accordance with the German military tradition nor were resources available for the construction of fortifications. So von Seeckt decided on mobile defense with mechanized forces.⁴⁸

The civilian leadership between 1918 and 1933 had only limited influence on military matters. The Reichswehr never accepted political parties and political leaders with the exception of the president. He was regarded as a substitute for the emperor who had been the commander in chief and to whom the officer corps felt responsible. Of course there was political guidance with regard to the strategic orientation and the budget of the armed forces. However the military of the Weimar Republic was generally free from political influence compared with the western democracies. In such a climate the Reichswehr and its leaders were relatively free to organize the institution and to train its members in accordance with their ideas.⁴⁹

The independence from restrictive and limiting civilian influence also had important disadvantages for the military. There was no public and no political discussion of strategy, of operational demands, and of tactics. There was in principle neither broad political control of the weapons programs nor major interventions on training objectives and questions to the educational system. The lack of a broad discussion certainly contributed to Germany's failure on the strategic level, but it also influenced the formulation of military doctrine on the operational and tactical level.⁵⁰

⁴⁷ See James S. Corum, *The Roots of Blitzkrieg* (Lawrence: University Press 1992), 172: France in the West has even become stronger after World War I and the puffer of Alsace and Lorraine was lost. At the eastern border Czechia and especially Poland have become a threatening factor.

⁴⁸ Nevertheless there were also alternatives discussed. See *Ibid.*, 55

⁴⁹ When Hindenburg became president in 1925 this had been still enforced because he was the most respected German Soldier in the public opinion. And when General von Schleicher became defense minister in 1932 he enforced the dissolution of the hated democratic institutions and worked towards a military dictatorship under the presidency of von Hindenburg.

⁵⁰ The "political independence" of the Reichswehr had to be paid by the Wehrmacht by a high price, the completely dependence on the dictatorship of Adolf Hitler. But before war, Hitler neither interfered in doctrine development nor in weapons procurement. He did not understand the armored idea to be the nucleus of the "Blitzkrieg." For

As mentioned before, an important aspect of the "Blitzkrieg doctrine" is the ground support of the attacking armored units by the air force. Under General Wever, a former Lufthansa official, a well-developed doctrine for air war was formed. Air minister Goering, the last commander of Richthoven's squadron in the Great War, had direct access to Hitler. He did not get involved in the development of doctrine or weapons systems but acquired the financial resources. Like in the other air forces in Europe and North America the priorities of air force missions were discussed in the German air force of the interwar period. Direct support for the army was only one of several tasks.⁵¹

The fact that a lot of air force officers including General Kesselring, the successor of Wever, had started their career in the army improved the cooperation between the two services. And contrary to the United States, the German air force was a completely independent service and as such had enough self-confidence to openly cooperate with the army. But like the army, the air force never had a document with regard to the lightning war.⁵²

As far as the "Blitzkrieg doctrine" is concerned, it can be summarized that at the beginning of World War II a formal doctrine did not exist. There was neither a translation of grand strategy into an overarching military picture of how to fight a war, nor was there a joint doctrine to be applied on the operational and tactical levels. Military or civilian authorities never approved a "Blitzkrieg doctrine".⁵³

But there was a Wehrmacht, relatively well-trained, with a high degree of military discipline and individual initiative. There was an army with the awareness that due to inferior forces, a campaign could only be won by the orchestrated use of all means available. There was further a military education based

more details on the relationship between Hitler and the Reichswehr see for example Matthew Cooper, *The German Army* (Chelsea: Scarborough House, 1978), 17-20, 38-58

⁵¹ Interdiction bombing was in the air force's favor. After local air supremacy had been established the German air force recognized that its primary task was to support the ground attack. At the end, the operations of the army will win the war. Therefore they have to be supported. Terror bombing of the population should only be used to weaken the enemy's resolve. For more details on the principle air force regulation 16 'The Conduct of Aerial War' see James S. Corum, *Luftwaffe: Creating the Operational Air War 1918-1940* (Lawrence, KS: University Press of Kansas, 1997), 140-144

⁵² Bryan Perrett. *A History of Blitzkrieg* (New York: Stein and Day, 1983), 73

⁵³ Because "Blitzkrieg doctrine" is a commonly understood expression it will be used further on.

on the principles of maneuver and decisive action broad enough to incorporate technological progress.⁵⁴ There was an army which was not better motorized and mechanized than the other major nations, equipped with tanks, which were in principal not superior to the French, neither in quality nor in quantity. All this had been developed on the bases of Prussian and German military tradition, shaped by the experience of the Great War in a unique social and political environment.

From a formal point of view the most important fact is that the transformation process in Germany was to a very high degree internally initiated. Even in a very traditionally oriented and hierarchically structured organization, military change was possible without political pressure. The experience of Germany also confirmed the importance of one or more key persons for the process of change. It additionally underlined the value of an intellectual culture of transformation. The internally initiated transformation process could only be successful because it did not constitute a radical change but an evolutionary process in accordance with the experienced tradition of the military institutions in Prussia and Germany. There is more than one question as to whether a change, not along the tradition and familiar lines, would have been successful even under the pressure of political leaders.

The capability to initiate and conduct a reform was also supported by organizational prerequisites. With the general staff, or the "Truppenamt" (troop office), the German military had an effective internal instrument. It dominated the branches and did not allow jealousies to hamper transformation. But there was not a special division dealing only with transformation issues.⁵⁵

As far as the external factors are concerned, the most important influence came from the restrictions of the Versailles Treaty, which forced the military to look for innovative and creative solutions. Beyond these limitations, the geo-strategic situation, with two presumably superior enemies on two opposite borders, had an impact on the internal will to reform even without any initiative from political leaders.

⁵⁴ And there was an open issue with regard to the character of an attack: priority of velocity or of guarded flanks and dominance of infantry over armor or independent armored actions.

⁵⁵ This was never intended and would have been counter-productive. The general staff was on the one hand highly recognized in the army because of its capabilities but was on the other hand also watched very carefully and with a certain sort of jealousy.

The outcome of the Great War not only dominated the political constellations for the transformation process, it also set the military starting point of the evolutionary adaptation process. But the problem was to find the right conclusions from the past for the future, to identify the decisive factors and to eliminate those special circumstances which only impede a clear view of the picture. Finally it has to be recognized that this model of transformation failed on the strategic level. One reason was that the Reichswehr as well as the Wehrmacht functioned as closed shops. Strategies and other military issues were not discussed in a broad forum among experts of different sciences.

Factors of General Validity in World War I, the Interwar Period and World War II

As far as the process of developing a doctrine is concerned the example of the German "Blitzkrieg doctrine" shows the dominance of tradition and internal climate as well as personality. The German military development in the interwar era also shows that doctrine can only provide a solid basis for training and combat if it is valid over a relatively long period of time and if it is broad and general enough to embody technological development as well as different combat situations. Thus transformation is an evolutionary process, in which the potential and the will of the members of the organization can be fully activated and used.

If we look into the "Blitzkrieg doctrine," five factors of general validity can be identified. They found their origin in Prussian warfare during the Napoleonic era and in World War I. German warfare continued to be dominated by the principles of concentration of forces at the decisive point, maneuver and mobility of forces, flexibility, leadership and initiative, and orchestration and coordination of the various forces.⁵⁶

Concentration of forces at the decisive point was one of the main features of "Blitzkrieg" and has been part of the Prussian-German military tradition. Without superiority at the decisive place and at the decisive time it was not possible to achieve a decisive result. This principle had also been true during the

⁵⁶ Matthew Cooper provided an informative summary of the German strategic tradition under the headline "Mobility is the Keynote of War". See Matthew Cooper, *The German Army 1933 - 1945* (Chelsea: Scarborough House, 1978), 130-138

Great War, especially at the beginning and at the eastern front. But it was also correct for the West. The German attacks in spring 1918 delivered an obvious example. Even the trench warfare can be interpreted in this direction. If the principle had been applied in the right way, if strongholds had been avoided and the enemy had been hit in the rear, the fatal trench warfare could have been avoided.

To mass forces at the decisive point as a general principle neither asked for a certain force ratio such as the well-known 3:1 superiority of the attacker over the defender, nor did it mean to concentrate overwhelming force. Massing forces had nothing to do with wasting forces. The idea was to bring forces to bear from different directions at an unexpected time and point. According to von Moltke the catchword was to maneuver separately but to defeat the enemy with a unified effort.⁵⁷ On the strategic level the most important consequence of the indirect approach was that the various battles had to be seen in the context of the whole campaign. And the campaigns contributed to defeat the enemy strategically. Continuous battles and campaigns to accomplish the aim to defeat the opponent replaced the linearity of the battlefield.

Concentration of forces at the decisive point and time required maneuver and mobility. The first purpose of maneuver was to bring one's own firepower effectively to bear. In this sense, firepower cannot be understood as its own factor of warfare but as part of concentrating forces. Without maneuver the enemy could not be hit in the rear and in depth. Progressing mechanization and communications allowed forces to act in accordance with that principle. On the strategic level the invention of the railroad constituted an important step towards mobility. Without railroads the strategic concentration would not have been possible. Mechanization created the preconditions for adequate mobility especially on the operational level. Technical advances made the implementation of concentrating forces at the decisive point more perfectible than it had been for Napoleon, Moltke or Schlieffen.

⁵⁷ Hew Strachan, *European Armies and the Conduct of War* (London: Allan and Unwin, 1986), 99: 'Incomparable more favorable will things shape themselves if on the day of battle the forces can be concentrated from different points towards the battle itself – in other words, if the operations have been conducted in such manner that a final short march from different points leads all available forces simultaneously upon the front and flanks of the adversary.'

The tempo of maneuver was determined not only by the degree of mechanization of the attacking forces but to a high degree by the information and the logistic support the attacking forces received. One example from the campaign in Western Europe may be sufficient for illustration. The thrust of the German attack in France in 1940 could not have been fully exploited because of the lack of information about threatening enemy forces. So with increasing technical mobility the demands for command, control and information had also increased.⁵⁸

Without flexibility it would not have been possible to shift the point of main effort and to concentrate the forces continuously. Besides the respective mental flexibility, the force structure played an important role with this regard. The triangular division proved to be superior to the structure with four maneuver elements and the various echelons contributed positively to the element of surprise of the German attacks. Without Guderian's initiative and resolve to push forward after having crossed the Meuse River in 1940 the campaign would certainly have been less successful. And if von Manstein, as the chief of staff of Army Group B, had not interfered in the planning process for attacking France, Guderian most likely would never had crossed the Meuse. So every force level can contribute to flexibility of the system. On the strategic level the general staff was the prerequisite for flexible planning. On the tactical and operational level the German broad doctrinal principles provided the prerequisites for flexibility in combat.⁵⁹

This brings us to the fourth factor dominating warfare, the influence of leadership and initiative. Beside tradition the factor of personality –itself influenced by tradition- had the most dominant impact on the “Blitzkrieg doctrine” and on warfare in general. Mobile warfare, to maneuver separately and to defeat the enemy in a unified effort, to exploit a penetration and to attack with deep flanks demanded not only crafted leaders. It required even more for leaders prepared to take responsibility and able to decide independently in accordance with the situation on the battlefield. The Blitzkrieg campaigns were not successful because of better equipment or the use of superior technology. Key to success was the mental

⁵⁸ Huba Waas de Czege, “*Global Engagement VI Insights*” (SAMS reprint 2002, document available), 19

⁵⁹ Matthew Cooper, *The German Army 1933 – 1945* (Chelsea: Scarborough House, 1978), 217-230

product of combining the technology available and of developing the adequate doctrine. Thus in war as well as in peacetime a climate of mutual trust and critical loyalty proved to be decisive.

The last factor to be discussed is the orchestration of available capabilities in doctrine and on the battlefield. The "Blitzkrieg doctrine" did not rely on the thrust of the pure armored arm. *Army Regulation* 487 "Leadership and Battle of Combined Arms" already emphasized the importance of a well-orchestrated and coordinated employment of all arms available. And as shown above this was the result of the experience gained during the Great War and it was confirmed by the minor clashes during the interwar period. Especially the Spanish Civil War showed how effective close cooperation with the air force can be and how ineffective uncoordinated ground operations were.⁶⁰

The nature of war didn't change in the relative short period of time including World War I and II and in the interwar period in Europe. Despite the fact that the nature of warfare varied, the above-mentioned factors remained valid. But it has to be emphasized again that these factors always had a different appearance dependent on the respective technological development.⁶¹ This seems to be especially true for minor wars, where special circumstance may negatively impact a clear view.

The Influence of the Civil War in Spain and the Japanese Invasion in China

Military tradition set the frame for the development of the Blitzkrieg doctrine. This had been reinforced by the experience drawn from the Great War. When looking on the influence of the Civil War in Spain and the Japanese invasion in China, this has to be done especially with regard to the special circumstances influencing the process of doctrine development. These wars have been chosen because Germany was directly involved in the Spanish Civil War, which was said to be the laboratory for new weapons. The Japanese-Chinese War has been chosen because of the involvement of Japanese troops,

⁶⁰ See the official report of the general staff of the army on the participation of the German army in the Spanish Civil War: Wolfgang Kern and Erhard Moritz, "Lehren des faschistischen deutschen Oberkommandos des Heeres aus der bewaffneten Intervention in Spanien 1936-1938" *Militärgeschichte* 15 (March 1972), 321-327

⁶¹ Huba Wass de Czege and Richard H. Sinnreich, "Conceptual Foundations of a Transformed U.S. Army," *The Institute of Land Warfare Association of the United States Army* [Journal on-line] (2001, accessed 28 January 2003); available from <http://www.ausa.org/PDFdocs/lwp40.pdf>; Internet: 1

which were known for their high military standards. Another reason was the offensive nature of Japanese warfare similar to German warfare. Both military clashes fell in a time in which Germany was preparing for war. There is a high likelihood that the experiences of both wars may have had an impact on German war fighting doctrine.⁶²

The Swiss officer and historian Gustav Daeniker described the challenges faced when trying to draw conclusions from the experience of war. Only war is able to bring the efficiency and effect of war material to bear. This fact makes military work in peace very difficult. The longer the time-distance to the past war, the greater is the danger that experience is no longer in accordance with present developments and needs. But there is also an advantage of time-distance. It prevents being lost in too many details.⁶³

Two factors especially influence the experience of a minor war. One's own commitment with current developments in doctrine and weapons systems leads to a tendency to selectively perceive the respective environment. In general the facts are interpreted in accordance with one's own theoretical model. If the facts definitely cannot be brought into accordance with the theoretical construct, there is a danger to ignore the conditions and not to reflect on the theory. The phenomenon of selective perception is well known and nevertheless it is experienced every day.

The recognition of the special circumstances of a war is key to its evaluation and key to drawing the correct conclusions for the future. It helps to handle the facts in the right way, neither to ignore them, nor to see evidence for a theory where there is none. In accordance with Daeniker, several preconditions have to be fulfilled in order to be able to assess a certain war material during a certain war. The soldiers employing the weapons must not only be well trained to use them; they must also be familiar with the

⁶² Bryan Perrett, *A History of Blitzkrieg* (New York: Stein and Day, 1983), 68; Welsch, Otto, "Der Einfluss der Verkehrsmittel auf die Kriegführung in China," *Wehr und Wissen*, 20 (1939): 428

⁶³ Gustav Daeniker, "Betrachtungen über die Bewertung von Erfahrungen mit Kriegsmaterial in Spanien," *Wehr und Wissen* 18 (1937): 33

tactical principles of the employment of the weapon. The more complex the weapon, the greater the influence of the fighter's capability will be.⁶⁴

The environment or framework for the employment of a weapon must be comparable because its efficiency can only be assessed in context and with regard to the task it has been designed for. Modern weapons especially are designed to operate in very special integration with other weapons systems, tactical principles, and theories. They can show their efficiency only in this specific technical and tactical environment.

The targets the weapon is faced with must be at least similar to those for which the weapon has been designed. In a minor military clash where only one party has tanks at its disposal, the suitability of the tank to fight other tanks cannot be evaluated. The weapon will then be employed against targets it was not designed for and will be evaluated accordingly. The enemy in the war to be evaluated must have respective counter-measures, otherwise the use of a weapon or a weapons system cannot really be assessed. For example in a scenario without anti-tank weapons the overall effectiveness of tanks can hardly be established.

Finally terrain and climate can have a tremendous impact on the efficiency of a weapon or a weapons system. Most systems can bring their real performance to bear only in certain terrain. A tank for example must have the opportunity to use its speed and firepower over a long distance. In terrain where it cannot use its advantages it can easily be defeated by infantry or anti-tank weapons.⁶⁵

As far as the Japanese war in China is regarded, practically none of these necessary preconditions were fulfilled. The climate and terrain in China differed from Europe. The terrain was mountainous whereas uncovered flat plains dominated the eastern parts of the European battlefield. At the beginning of the war on the battlefield south of Beijing there were only two divisions on each side. The badly equipped Chinese forces were soon reinforced so that they outnumbered the Japanese. The Japanese tried

⁶⁴ Gustav Daeniker, "Betrachtungen über die Bewertung von Erfahrungen mit Kriegsmaterial in Spanien," *Wehr und Wissen* 18 (1937): 36

⁶⁵ *Ibid.*, 37-39

to balance this by the employment of additional light divisions. The Chinese army was neither equipped with tanks nor anti-tank weapons. Especially in the northern parts, China conducted a partisan war around major traffic and communication centers. In addition there were nearly no air defense systems on the battlefield. The equipment of the air force did not meet European standards.⁶⁶

Nevertheless, Germany looked on the Japanese plans for the initial deployment and on the influence of railroads on warfare in a large country. The most important consequence was that wide space in the age of motorization no longer constituted a sanctuary as it had in the Napoleonic era.⁶⁷

Despite the general differences in warfare for the Germans the war proved again that frontal attack even by superior forces with excellent equipment was not successful. Attack on the weakest point and encirclement by fast troops was the best recipe and could overcome trench warfare, even with relatively weak forces. Whenever the terrain and the enemy situation allowed, the employment of armored and motorized vehicles was a key to success. The few large scale armored attacks also showed that they have to be supported by air forces because artillery at a certain phase had proven to be unable to protect the thrust.⁶⁸ The different deep attacks of motorized Japanese formations were of interest because they showed that the available infrastructure must be used to take objectives in the flank of the enemy. The proper use of smaller tactical formations in the enemy's rear can have tremendous impact on the situation at the front line.⁶⁹

With regard to the human factor Germany recognized the excellent performance of the communist red guerilla brigades. They were seen as the Chinese center of gravity. On the Japanese side, the will to fight and win the war and the enthusiasm of each soldier had important influence on the outcome of the

⁶⁶ See „Japans Feldzug in China – vom Kriegsbeginn bis zum Fall von Nanking,“ *Wehr und Wissen* 19 (1938): 887: A fast division consisted of two motorized infantry regiments, one tank regiment and a motorized artillery regiment

⁶⁷ Welsch, Otto, „Der Einfluss der Verkehrsmittel auf die Kriegführung in China,“ *Wehr und Wissen* 20 (1939): 427-453

⁶⁸ „Japans Feldzug in China – vom Kriegsbeginn bis zum Fall von Nanking,“ *Wehr und Wissen* 19 (1938): 885-897

⁶⁹ Welsch, Otto, „Der Einfluss der Verkehrsmittel auf die Kriegführung in China,“ *Wehr und Wissen* 20 (1939): 440

war. However cohesion within a formation proved to have even more impact on the outcome of the battle.⁷⁰

A minor Japanese-Russian incident during the war was of special interest for Germany. The Tschangkufeng incident at the Siberian-Korean border in 1938 provided the German general staff still another lesson to be learned from this war. In July 1938 the Russians occupied the tactically important Tschangkufeng hills on the Korean side of the border. The Japanese regained parts of the hills by a surprise attack. The USSR unsuccessfully tried to retake the territory by a massive attack of about 20,000 infantry soldiers supported by artillery, air force and armored units.

In the eyes of Germany, the USSR with its presumably superior technology and doctrine failed in their first real test. In the German interpretation, the Russians retreated because they were not interested in showing the world the Red Army's weaknesses. About 50% of the shells did not explode, the aircraft dropped the bombs far away from the targets, logistics did not work at all and motorized vehicles and weapons systems failed. But according to the German view, the most important cause of the defeat was the lack of leadership and decisiveness of the Russian officers.⁷¹

There were no new major findings for Germany in the Japanese-Chinese War. Their own principles were generally confirmed. The findings about the lack of Russian leadership were easily accepted. But it was not recognized that partisan warfare against lines of communications could become exhausting for an army fighting in a wide space. In addition the German general staff did not draw any conclusions from the fact that the Japanese were not able, even with mechanized forces and by using the advantage of the technological development, to force the Chinese into a decisive battle in the large country. The German conclusions from the Japanese-Chinese War seem to show that minor clashes only served to confirm the already existing principles of German doctrine.

The Spanish Civil War was different. Italy, the USSR and Germany were directly and officially

⁷⁰ "Japans Feldzug in China – vom Kriegsbeginn bis zum Fall von Nanking," *Wehr und Wissen* 19 (1938): 889

⁷¹ "Der Feldzug Japans in China – von der Schließung des Lunghai-Korridors bis zum Fall Hankous," *Wehr und Wissen* 19 (1938): 110-126

involved with forces. In addition there were various contingents of volunteer fighters from all over the world. Military attachés and the media monitored the battlefield. With regard to the conclusions drawn, there seemed to be a tendency that air forces were much more willing to learn from the Spanish Civil War than were the armies.⁷²

The German military did not ask for an employment of military forces in order to test weapons or doctrine. The commitment was for purely political reasons and initiated by Hitler himself, who then showed only little interest in the military operations in Spain.⁷³ Germany had a land component in Spain that grew from two armored companies with PzKw I (Mark I) at the beginning up to the equivalent of four tank battalions at the end in 1938. The German air force provided twenty transport aircraft (Ju 52), the so-called Condor Legion with about 30 bombers (Ju 52), three squadrons of fighter aircraft (He 51) and some reconnaissance aircraft as well as up to eight air defense batteries. Additionally an experimental flight element was included in order to test the latest aircraft models in combat. At the end, the Luftwaffe had about 200 aircraft in Spain, among them the more modern models He 111, Do 17, Me 109 and Ju 87. It constituted a balanced force of bombers, fighters and naval seaplanes.⁷⁴

The Spanish fighters on the ground were to a large extent not trained in overarching doctrine. The equipment consisted of a vast variety of what could be made available on either side. There was no standardization at all. In addition to the lack of machine guns there was no tank arm and there was a lack of artillery. The latter caused the air force to fulfill tasks that were normally the responsibility of the artillery. The battles in most cases took place along small river valleys or in the vicinity of cities and villages. All these factors did not favor the assessment of the utility of the tank for warfare in general. It was even difficult to draw any conclusions about the respective doctrine for the employment of tanks.⁷⁵

⁷² James S. Corum, "The Spanish Civil War: Lessons Learned and not Learned by the Great Powers," *The Journal of Military History* 62 (April 1998): 313

⁷³ Charles Messenger, *The Art of Blitzkrieg* (London: Ian Allan Ltd, 1976), 101

⁷⁴ Ibid., 101

⁷⁵ Gustav Daeniker, "Betrachtungen über die Bewertung von Erfahrungen mit Kriegsmaterial in Spanien," *Wehr und Wissen* 18 (1937): 36

The general lesson for ground forces seemed to be that tanks could take terrain but were not able to hold it. So they could not fight as a separate arm. The few commitments of tanks obviously supported this view. The first occasion was in 1936 when the Russians overran the Nationalists in Esquivas. During the exploitation the Russian tanks lost contact with their infantry and did not receive any logistic support and were forced to withdraw. The same experience occurred with an armored battalion with German participation and equipped with the Mark I when they attacked the Republicans some weeks later near Madrid. Anti-tank guns stopped the initial success and the forces were defeated by a Russian counter-attack. In March 1937, a mechanized Italian division attacked on Guadalajara. After having gained some 20 miles in five days they were hit by a Russian counter-attack supported by air force. But in the exploitation of the initial success the Russians suffered the same fate as at Esquivas and they had to fall back.⁷⁶

In general, the tactics used by the opponents were different. It is even questionable whether there were any coherent tactics on either side. In principle, the Nationalists tended to keep their tanks close to the infantry, unlike the Russians. There were no attempts by either side to bypass strong points or to exploit initial success.⁷⁷

Most European armies were relieved that motorized forces were not as important as progressive theorists thought they would be. For them the anti-tank gun proved to be superior to the tank. George F. Hofmann provided an excellent picture of how the U.S. Army dealt with the Spanish Civil War. A lack of first hand information, invalid interpretation of available information, military culture (especially branch rivalry involving the infantry branch) as well as restricted financial resources led to the conclusion that tanks were vulnerable to antitank guns because of their light armor. Thus tanks operating alone were doomed to disaster. The major source of information was the U.S. military attaché to Spain

⁷⁶ Bryan Perrett, *A History of Blitzkrieg* (New York: Stein and Day, 1983), 68

⁷⁷ *Ibid.*, 69

who later, as the chief of infantry, became the principal opponent against creating a combined arms mechanized force.⁷⁸

Based on the reports of military attachés and foreign military journals the US Army War college concluded in 1937 that mechanization had not revolutionized the conduct of war, and that the gun-armor race favored the antitank weapon. The study claimed further that the use of tanks had been faulty because they lacked armor, armament and the support of infantry and artillery. In the same year the Command and General Staff School concluded that mechanization, motorization and airpower had benefited the defense more than to the offense. These assessments provided the impetus for the 1938 tank policy of General Douglas MacArthur, then Army Chief of Staff, which prevented the Army from gaining experience with a combined arms mechanized force at the operational level.⁷⁹

Some French officers on the other hand asked for heavier tanks for close-in combat support because the tanks available on the battlefield had not produced the results expected. However, despite thinking about an instrument stronger than the German Panzer division for counter-attacks, in France emerged the false lesson from Spain that the anti-tank gun had now outstripped the tank. This met the general attitude in France. Politicians, military elite and large parts of the population remained transfixed by the idea of the defensive shield of the Maginot line.⁸⁰

The Russian commander reported back home that the new idea did not work and armor could only be used in support of infantry.⁸¹ In the same way the British theorist Liddell-Hart was skeptical with regard to his own theory about the employment of tanks as independent weapons.⁸² J.F.C. Fuller expressed the

⁷⁸ George F. Hofmann, "The Tactical and Strategic Use of Attaché Intelligence: The Spanish Civil War and the U.S. Army's Misguided Quest for Modern Tank Doctrine," *The Journal of Military History* 62 (January 1998): 103-104

⁷⁹ Ibid., 121, 122, 130

⁸⁰ Charles Messenger, *The Art of Blitzkrieg* (London: Ian Allan Ltd, 1976), 114

⁸¹ Ibid., 105

⁸² George F. Hofmann, "The Tactical and Strategic Use of Attaché Intelligence," *The Journal of Military History* 62 (January 1998): 69

view that there was no reason to be disappointed about the outcome of the Spanish Civil War with regard to the armored question.⁸³

The German assessment of the role of tanks during the Spanish Civil War was not as clear as one would believe. On the one hand, General Guderian pointed out that the mountainous terrain channeled armor thrusts along the valleys, which deprived them of its ability to maneuver. The scale of the operations in the civil war was not large enough to bring the advantages of the armored idea to bear. Additionally the war had never been suited to test doctrine.⁸⁴ Other German officers emphasized that at least the Spaniards and Italians were not well trained and thus no conclusions on the efficiency of armor could be drawn.

But the official report of the general staff of the army on the participation of the German army in the Spanish Civil War came to rather different conclusions. It emphasized that in principle, German army elements had never been committed as a whole so it was impossible to draw direct conclusions from the engagement. After dealing with co-operation with allied forces and the associated problems, the secret report laid down the tactical experiences and pointed to conclusions drawn by other nations. Key to success was the coordinated commitment of all weapons. Attack would only be successful if conducted by adequately and well-trained infantry, which had to be supported by tanks, heavy artillery, and air force.⁸⁵

"The importance of the infantry as the main weapon was confirmed even under the Spanish conditions."⁸⁶ This was one of the major results of the general staff's report. As far as the tank was concerned the report pointed to the special situation in Spain with regard to terrain, outdated tank models, lack of training and artillery support, as well as the employment of tanks as a single weapon to infantry support and not as compact units or even battalions. The assessment by other nations that

⁸³ Charles Messenger, *The Art of Blitzkrieg* (London: Ian Allan Ltd, 1976), 112-114

⁸⁴ Bryan Perrett, *A History of Blitzkrieg* (New York: Stein and Day, 1983), 69

⁸⁵ See Wolfgang Kern and Erhard Moritz, "Lehren des faschistischen deutschen Oberkommandos des Heeres aus der bewaffneten Intervention in Spanien 1936-1938" *Militärgeschichte* 15 (March 1972), 327

⁸⁶ *Ibid.*, 330

protection and firepower was of greater importance than speed and maneuver was shared. In general, for the official German side, the tank proved to be inferior to the antitank weapons.⁸⁷

According to the army general staff, the air force commitment in Spain cannot be used as an example of a methodical and homogeneous air war. As far as the cooperation between the army and air force was concerned, air support contributed several times to the decision on the ground. According to the general staff, it was not likely that the air force would be able to support ground forces to the same extent in a future large-scale operation. But after the positive experience with ground support, in the future no military leader would like to give up this option. Here, the German view differed to a large degree from that of other nations.⁸⁸

Apart from cooperation with the air force this assessment did not differ too much in principle from the assessments of other nations. In this regard the general staff of the German army was not better than the other general staffs. The report on the participation of the German army in the Spanish Civil War could not have a great impact on the "Blitzkrieg doctrine" because it was signed at the end of March 1939. Despite the fact that it was distributed to all major army staffs up to the level of division headquarters, it came too late. The forty-eight-page report did not include concrete orders with regard to training necessities. The fact that a colonel signed it only shows that the German army did not pay more attention to the Spanish Civil War than other Armies in Europe or North America.⁸⁹ The only difference was that the German army was not restricted by a civilian leadership in developing its ideas and concepts.

⁸⁷ Wolfgang Kern and Erhard Moritz, "Lehren des faschistischen deutschen Oberkommandos des Heeres aus der bewaffneten Intervention in Spanien 1936-1938" *Militärgeschichte* 15 (March 1972), 332-334

⁸⁸ Ibid., 328

⁸⁹ The report was signed by quartermaster III -5- of the general staff of the German army. This branch was responsible for organizational issues of the army. For details of the report see Wolfgang Kern and Erhard Moritz, "Lehren des faschistischen deutschen Oberkommandos des Heeres aus der bewaffneten Intervention in Spanien 1936-1938" *Militärgeschichte* 15 (March 1972), 321-327

⁸⁹ James S. Corum, *The Luftwaffe. Creating the Operational Air War 1918-1940* (Lawrence, KS: University of Kansas Press, 1997), 186

Much more than the army the German air force seized the opportunity to gain highly interesting information about its weapons systems as well as tactics and to gain some combat experience at least for a limited circle of about 19,000 personnel. The Luftwaffe entered the war in Spain with a balanced and well-developed air doctrine. Despite the fact that no field manual was adopted the air force recognized the need to improve cooperation with the army in order to provide effective air support. The experience confirmed the existing doctrine and provided the opportunity to adjust methods and processes beneath the doctrinal principles. So the pilots developed a new battle formation in Spain, which provided a remarkable advantage in the fighter combat of 1939-40.

The primary targets for the Legion Condor were Republican logistics and enemy troop concentrations. But the Legion did not only provide air support for the Nationalists. It could fight the whole spectrum of missions. In the first two years of the air force commitment in Spain, more aircraft were lost to operational accidents in bad weather and night flights than in combat. As a consequence unit training in flying and navigation by instruments in Germany was intensified. In addition, Spain provided a good opportunity to test the new dive-bomber, the Ju 87.⁹⁰

The Condor Legion was also involved in the most spectacular and fatal bombardment of the Spanish Civil War, the air attack on the small town of Guernica in April 1937. Forty-three German bombers dropped about fifty tons of explosives on the town and more than 1700 civilians died.⁹¹ This experience did not deter senior air force officers such as Wolfram von Richthofen from advocating strategic bombing theories. They only realized that conducting a strategic bombing campaign would not be appropriate under the conditions in Spain.⁹²

Beside the invention of new fighter tactics, the importance of fighters as the decisive factor to gain

⁹⁰ James S. Corum, *The Luftwaffe. Creating the Operational Air War 1918-1940* (Lawrence, KS: University of Kansas Press, 1997), 186

⁹¹ *Ibid.*, 199: In accordance with Corum recent studies speak of about 300 killed civilians and that there is no evidence that the German Commander Wolfram von Richthofen carried out the policy of terror bombing.

⁹² *Ibid.*, 222

air superiority and the efficiency of the air defense system were confirmed.⁹³ The German air force also recognized in Spain the defensive capabilities of air power and the need to protect bombers by a fighter escort. Additionally the value of anti-aircraft guns for the defense of ground forces was learned.

But like other forces, the Luftwaffe also failed in assessing the results of the Spanish Civil War. It did not realize the effectiveness of naval aviation. Even with obsolete aircraft, considerable success was gained in interdicting Republican shipping. But neither the air force nor the navy was interested in this success. Inter-service rivalry between both parties was one of the reasons.⁹⁴

Much more than the ground forces the national air staffs drew different conclusions from Spain. The British Royal Air Force (RAF) showed a general indifference towards the events in Spain. Since the 1920s its doctrine had been concentrated on strategic bombing. During the 1930s it emphasized the bomber fleet to such an extent that parliament funded the build-up of a fighter force against the resistance of RAF leaders. The misfortune of the strategic bombing of Guernica did not find any interest or reflection at the RAF's higher level.⁹⁵

The U.S. Army Air Corps made more effort to study the war in Spain than the RAF. The air transport activities in Spain were of special interest. This lesson was learned very well. But despite the bombing of Guernica and the Italian bombing of Barcelona in 1938, strategic bombing was heavily defended against critics. In general, the Spanish Civil War was not seen to be of importance because it provided only a few lessons about industrial paralysis and strategic bombing. The fact that several army officers concluded that strategic bombing had not had any influence on the population made it even more difficult for the Air Corps to recognize these factors. Internal rivalry and selective perception dominated the process.⁹⁶

⁹³ Otto Welsch, "Gedanken über den Spanischen Krieg," *Wehr und Wissen* 19 (1938): 345

⁹⁴ James S. Corum, *The Luftwaffe. Creating the Operational Air War 1918-1940* (Lawrence, KS: University of Kansas Press, 1997): 212-213; James S. Corum, "The Spanish Civil War: Lessons Learned and not Learned by the Great Powers," *The Journal of Military History* 62 (April 1998): 325-327, 333

⁹⁵ James S. Corum, "The Spanish Civil War: Lessons Learned and not Learned by the Great Powers," *The Journal of Military History* 62 (April 1998): 315-318

⁹⁶ *Ibid.*, 318-322

The French air force studied the war in Spain very carefully. It provoked a renaissance of air doctrine in France. A dynamic air minister recognized the offensive use of air power. The reform program that followed was coupled with an extensive review of the air commitments in Spain. But after the air minister had to resign, General Gamelin insisted on a generally defensive role for the air force. The reform was stopped by service rivalry.⁹⁷

Italy entered the Spanish Civil War officially with a doctrine based on Douhet's theory of strategic bombing. But important steps had already been taken to create an air doctrine stressing attack aviation and joint operations. Spain was seen as a testing ground. After the bombing of Barcelona in 1938, Douhet's theory was obsolete because it proved to be counterproductive. The bombing of Barcelona caused a lot of damage in the city but it seemed to anger more people than it terrified. The desired moral result did not occur. The Italian officer corps was adaptive and professional. Due to a lack of financial resources, Italy was not able to build the modern air force it wanted.⁹⁸

It can be concluded that the Spanish Civil War did not influence the development of the "Blitzkrieg doctrine" decisively. It provided the German military only limited information about the efficiency of armored forces. The Spanish Civil War did not contribute to the decision upon the armored idea nor did it formally influence army doctrine. In principal, every nation felt confirmed in its doctrinal and tactical approach with the exception of Russia. It drew the conclusion to reorganize its mechanized forces and to give up the idea of an independently operating tank arm.⁹⁹ The war provided much better information to the Luftwaffe especially with regard to the efficiency of its weapons systems and the cooperation with ground forces.

The experience with regard to the "Blitzkrieg doctrine" and the comparison of various nations showed that willingness and ability to examine a minor war depends on the culture of the institution. The

⁹⁷ Ibid., 322-324

⁹⁸ James S. Corum, "The Spanish Civil War: Lessons Learned and not Learned by the Great Powers," *The Journal of Military History* 62 (April 1998): 327-329, 333-334

⁹⁹ Charles Messenger, *The Art of Blitzkrieg* (London: Ian Allan Ltd, 1976), 105

conclusions drawn from these wars are frequently used to support the present direction of transformation. Military professionalism tends to be dominated by the influence of civilian and military leaders, financial resources and inter-service rivalry. Minor wars tend to be misused to confirm the predominant ideas or interests of military respective political leaders.

Taking the special circumstances of the two conflicts into account, like the standard of training, the knowledge of doctrine and its application by the parties, as well as the specialties of terrain and climate, the five factors of general validity were in general neither contradicted by the Spanish Civil War nor by the Japanese-Chinese War in the Thirties. For example, the armored attacks of the Russians and Italians in the Spanish Civil War were unsuccessful because the logistic forces were not able to keep up with the attacking spearheads or the lack of leadership and ability to orchestrate a combined force not because the principles of concentration of forces, maneuver and mobility, flexibility, leadership and coordination of forces were wrong.

CHAPTER FOUR

CONCLUSIONS FOR THE ONGOING TRANSFORMATION PROCESS

As shown in the relatively short interwar period, it has always been difficult to anticipate the nature of the next military conflict and the doctrinal and material requirements it will impose. If the factors which dominated warfare during World War I and II and during the interwar period are still valid today, it would give an idea as to what direction to go with the process of Army transformation. At least it would provide evidence whether a more evolutionary or a revolutionary approach should be chosen.

Characteristics of Future Warfare

To define the future capabilities of an army we have to understand the environment in which future operations are likely to take place. Throughout the 20th century until the end of the cold war the major threat was posed by a definite and clearly defined number of nation states. The pattern of military activities in general was, despite some regional varieties, more or less the same. The consequences for Army doctrine, equipment, organization and training were relatively easy to predict. The global explosion of communications and the continuing proliferation of military technologies and especially of dual-use technologies have allowed nearly every state and even terrorist groups or individuals to use military capabilities that were formerly only available to highly developed industrial nations. Thus the environment of future military challenges for a super-power is not as obvious as it was during the cold war era.¹⁰⁰

Since there is no clear answer as to whom will be the next aggressor, there is also a problem with predicting the physical characteristics of a future theater of war. But increasing global urbanization and the tendency to intermingling combatants and non-combatants will pose new challenges. Additionally the availability of WMD, special operating force capability and communication networks will influence

¹⁰⁰ Huba Wass de Czege and Richard H. Sinnreich, "Conceptual Foundations of a Transformed U.S. Army," *The Institute of Land Warfare Association of the United States Army* [Journal on-line] (2001, accessed 28 January 2003); available from <http://www.ausa.org/PDFdocs/lwp40.pdf>; Internet: 3

future warfare. Last, but not least, the overwhelming military superiority of a nation itself could encourage an opponent to avoid direct confrontation and to shift its effort to weaknesses and vulnerable points such as strategic transport, lines of communications and stocks and facilities of the opponent. Delaying an effective response, making a response to appear expensive with regard to human lives, resources, and political consequences, will improve the chance of avoiding a commitment of superior forces at all.¹⁰¹

Network-Centric Warfare and Dominant Factors of Warfare

The general questions of who will be the opponent, where will a military commitment most likely take place, when will it take place, and what will it look like, can at present not be answered far in advance. For the US, the joint vision about how to fight a future war under these conditions can be found in the concept of network-centric warfare. This concept provides the basis for a comparison with the factors, which dominated warfare in the last century. Huba Wass de Czege has called this the first wave of the Revolution of Military Affairs.¹⁰²

As Paul Murdock wrote the architecture for network-centric warfare comprises the sensor grid, the information grid and the transaction (or shooter) grid. The sensor grid consists of a variety of diverse sensors such as infrared receivers, optical devices, acoustic systems, and people. The information grid comprises communication satellites, data-transmission lines, computers, and command centers, transmitting the information gained by the sensors as well as other relevant information about operations, logistics needed by leaders of all levels to plan, monitor and control operations effectively. Finally the transaction grid connects weapons with targets and guides weapons to the target. The weapons used are very accurate and most of them are retaskable. Others have the range and versatility to be used against

¹⁰¹ Ibid., 4

¹⁰² Huba Wass de Czege, "On Keeping Ideas Ahead of Technology," " (SAMS reprint 2002, document available), 4-6

almost any target within the battle space. Autonomous weapons can find and attack targets without any outside assistance.¹⁰³

To mass platforms and people under the conditions of network-centric warfare would constitute a high risk to operations. As a consequence, the physical concentration of forces has to be avoided and the effects of forces and weapons systems have to be concentrated on a decisive point. Due to advanced technology, units dispersed on the battlefield will be able to gain the information needed for targeting and to mass fires without the need to physically concentrate on the battlefield. But this is not really a new experience and has been already reflected in newer Army doctrines.¹⁰⁴ But even under the conditions of network-centric warfare, the principle of concentration of the effects of forces and platforms has to be applied to be successful and to use the means in an efficient way. To mass the effects of forces at the decisive space and time means to commit forces in accordance with economic principles. Thus concentration of forces at the decisive point is still valid but in the modified form of concentration of effects of forces and platforms at the decisive point and time.

The ability to mass fires over longer distances without concentrating forces does not mean that maneuver and mobility will become less important. Fires are able to deny but they cannot secure an area or region. There were only a few military conflicts that could be solved without exerting physical control over disputed ground. Even in the Kosovo conflict where the air campaign forced Milosevic to stop atrocities, ground forces have been employed to insure peace between the factions.¹⁰⁵

Urbanization, intermingling of combatants with non-combatants and the tendency of inferior forces to use human shields for their force protection make it impossible to fully rely on standoff fires. The challenge is to maneuver dispersed units beyond the line of sight and to co-operatively engage the enemy in close combat. This means the precondition for maneuver has to be provided by situational awareness.

¹⁰³ Paul Murdock researched the implications of network-centric warfare on the principles of mass and economy of forces. See Paul Murdock, "Principles of War on the Network-Centric Battlefield: Mass and Economy of Force," *Parameters*, US Army War College Quarterly XXXII (No 1, 2002)

¹⁰⁴ See for example FM 3-0, *Operations*, Washington, DC: Department of the Army, 2001, 4-13

¹⁰⁵ Huba Wass de Czege and Richard H. Sinnreich, "Conceptual Foundations of a Transformed U.S. Army," 21

You no longer move until you establish contact with the enemy. You now move dispersed combat elements towards the known enemy position taking full advantage of the terrain and then bring the effects of weapons to bear.¹⁰⁶

On the operational level, the physical disposition of the attacking forces need not be shaped with regard to the objective to the same degree as in the past. However the range of ground forces' weapons systems are still restricted even in the future, and thus operational mobility is of great importance. Favorable positioning of forces as preemptive measures and as a prerequisite of launching successful joint operations will be key in future warfare.¹⁰⁷ The more forces depend on airfields and seaports the more vulnerable they are. On one hand predictability leads to vulnerability. On the other hand vulnerability of forces depends on the time they are exposed to the enemy. Greater operational mobility decreases the vulnerability of forces.

According to Huba Wass de Czege, operational maneuver is a sequence of simultaneous movements of tactical units to locations in depth to concentrate their combat power against critical enemy forces and installations until his defense is destroyed. Future operational maneuver will likely involve smaller but more capable units, will be mounted with short preparation, and will conclude very quickly.¹⁰⁸

Under the precondition of power projection the future importance of strategic mobility seems to be beyond question. Despite the employment of modern technology terrain can only be taken and dominated by ground forces. There are no signs that ground forces will lose their relevance in the future. The second wave of the Revolution of Military Affairs may increase the strategic lift capability. It may enable the military to provide more combat power per deployed ton. It may also enable combat units to independently operate over a longer distance and time without a secure line of communication and sustainment.¹⁰⁹

¹⁰⁶ Ibid., 23

¹⁰⁷ Huba Wass de Czege, "Global Engagement VI Insights," 16

¹⁰⁸ Huba Wass de Czege and Richard H. Sinnreich, "Conceptual Foundations of a Transformed U.S. Army", 21: his last statement can be interpreted more as wishful thinking than as a matter of fact.

¹⁰⁹ Huba Wass de Czege, "On Keeping Ideas Ahead of Technology," 6

Network-centric warfare offers the means; e.g. sensors, information and weapons systems needed to operate at once on all levels of war.¹¹⁰ Simultaneity and jointness of operations will overtake the traditional sequential approach. Thus flexibility as well as orchestration and coordination of forces will become more important in the future.

Independent from network-centric warfare there will be a future need to be able to fight the whole spectrum of military activities with little warning time. Therefore the military must not only provide adequate training and material, but also look for a highly flexible force structure.

Two developments have to be mentioned in this context, modularity of forces and the question of echelons. Modularity in accordance with the requirements of the mission provides the flexibility needed to structure forces in an uncertain and rapidly changing environment. But there has to be a balance between the degree of modularity and the coherence of a unit necessary to fight successfully. Echelons assure the right span of control, agility and flexibility of the organization and constitute a division of labor between various institutional levels. How many levels are needed depend on the respective situation. As the concrete situation of the next commitment of forces cannot be predicted, flexibility will become of more importance in the future than it was in the past.

As well as the above already mentioned four factors, the fifth factor, leadership and initiative, will not decrease in importance for future operations. The demands and requirements for military leaders will instead increase within the concept of the network-centric battlefield. The growing need to coordinate and orchestrate the operation challenges leadership. Also, the soldiers must be prepared for the decreased predictability of demands. Training and education can no longer be focused on rigid doctrines. Soldiers must be prepared to react to unpredictable situations and treat rapid changes in mission and in environment as routine. Dispersed and autonomously acting tactical units increase the psychological demands on soldiers and especially on leaders of small units.¹¹¹

¹¹⁰ Paul Murdock, "Principles of War on the Network-Centric Battlefield," 92

¹¹¹ Huba Wass de Czege and Richard H. Sinnreich, "Conceptual Foundations of a Transformed U.S. Army," 20, 24

Technology will support the decision-maker but it cannot replace him. In the worst case the military leader should be able to accomplish his mission even without support. Military leadership in war cannot be replaced by management capabilities. But it has to be acknowledged that there is a great danger of misusing real-time information by higher echelons and to bypassing one or even more levels of command. The use of more technology does not mean that leadership will become less important on the battlefield.

To summarize, the factors which dominated warfare in the first half of the last century seem to be valid for the foreseeable future. The argument that asymmetrical threats have changed the nature of war cannot be proven. Collin S. Gray characterized asymmetry as something that works by defeating the common strategic imagination. Then asymmetric simply means different and there is no difference to war fighting in the past, where rather seldom two real equal opposing forces could be found. It has always been the challenge for military leaders to fight a different opponent with adequate means. The principles of warfare are still valid, only the means have changed. The five factors, which dominated warfare in the past, will also be applicable when fighting asymmetric threats.¹¹²

Transformation of the Army of the Federal Republic of Germany

Before concluding with working propositions for the transformation process, a view on the present German army could provide an idea of how other nations deal with military change. This could bring some further light on the driving factors behind military change.

The strategic situation of the Federal Republic of Germany generally differs from the U.S. strategic situation. Military transformation in Germany, a regional European power, has to be seen in the broader context of European identification and German reunification. The dogma of German foreign policy after World War II has been to avoid another isolation of the country. Consequently it has been concentrating on developing and strengthening a European identity as a prerequisite of a more balanced partnership

¹¹² Colin S. Gray examined the character of asymmetric threats and cautioned that traditional attempts to define such threats have generally been unproductive. Colin S. Gray, "Thinking Asymmetrically in Times of Terror," *Parameters*, US Army War College Quarterly XXXII (Spring 2002): 13

with the United States. Creating and maintaining security in Europe has been the main objective of German security policy. This is especially reflected by Germany's membership in NATO and the European Union. Security itself is defined by the absence of violence.¹¹³ Consequently the armed forces' main task is still territorial and Alliance defense.¹¹⁴

With the reunification of Germany the process of finding its place in the world has started again. Since then, the armed forces have become more an instrument of politics. Consequently within the last ten years the army has undergone a series of changes. After the integration of the "Peoples Army" of the former German Democratic Republic, the armed forces had to be reduced from then about 600,000 soldiers to 290,000 today. Even more important has been the mental process occurring in the armed forces. The former enemy had to be integrated. At the same time the soldiers have been oriented from a strict homeland defense posture to a broader mission spectrum including peacekeeping and peace enforcement operations in the Balkans and Central Asia. Ten years ago it would have been unimaginable that more than 10,000 German soldiers would be fulfilling their duty outside Germany and even outside Europe.¹¹⁵

Different from the US, this transformation process in Germany was initiated to a great portion by legal obligations such as the 2+4 Treaty,¹¹⁶ or the regulations of the Organization of Security and Cooperation in Europe (OSCE), and by financial restrictions of the state. Also quite different than the United States, there has never been a public discussion about the strategic orientation of the armed

¹¹³ See Bundesregierung, *Deutsche Verteidigungspolitik – Die Bundeswehr* [Document on-line] (2001, accessed 28 January 2003); available from <http://www.bundesregierung.de/servlet/init.cms.layout>; Internet.

¹¹⁴ Military crisis management has been added on. In addition, military cooperation plays an important role especially for the army. Humanitarian assistance will be provided as long as the respective capacity is available. See Robin F. Laird and Holger Mey, "The Revolution in Military Affairs: Allied Perspectives," *McNair Paper 60* [Paper on-line] (Apr 1999, accessed 28 January 2003); available from <http://www.ndu.edu/inss/mcnair60/m60ch6.html>; Internet, chapter 6, 2 and HDV 100/100, *Truppenführung (TF) (Command and Control)*, The Federal Ministry of Defense, Bonn, December 2000, No 104

¹¹⁵ See *Auslandseinsätze der Bundeswehr* [Document on-line] (2003, accessed 28 March 2003); available from <http://www.einsatz.bundeswehr.de>; Internet.

¹¹⁶ Treaty with regard to German sovereignty between the former German Democratic Republic, the Federal Republic of Germany (= 2) and the United States of America, the former USSR, France and Great Britain (= 4)

forces. To the contrary, the political climate in Germany is not in favor of military discussions. The military on its side, has always been looking to use the Alliance's obligations and the need to be able to interoperate with nations like U.S., France or the United Kingdom as an argument for modern equipment.¹¹⁷

In accordance with the German military tradition the main emphasis for change has been put on the development of military leadership, one of the five factors of general validity. The revolution of military affairs and its implications have been recognized. The Kosovo air campaign as a minor clash showed the lack of interoperability with U.S. forces. But there will be nothing implemented in the army, which poses a threat to the *Auftragstaktik* (mission oriented tactics).¹¹⁸

In the present army structure, heavy forces are still playing an important role, but provision has been taken for the creation of medium forces. With the Special Forces Division and the Air Mobile Division together with the creation of an armed forces command and control structure the first steps in direction of further transformation have been accomplished. In 2004 one mechanized brigade will be fully digitized.¹¹⁹

Army transformation is not an important issue in German politics and in the public. Due to self-inflicted restrictions the political leadership is not yet really interested in an army serving as a political instrument to realize national interests. This is not astonishing because national interests have not been defined in Germany. So the allocation of money in the federal budget follows other priorities. Because of the experience from two major wars there is still reluctance especially in the eastern parts of Germany to employ military means.¹²⁰ The army so far has been able to accomplish its missions in a low-level

¹¹⁷ See Robin F. Laird and Holger Mey, "*The Revolution in Military Affairs: Allied Perspectives*," *McNair Paper* 60 [Paper on-line] (Apr 1999, accessed 28 January 2003); available from <http://www.ndu.edu/inss/mcnair60/m60ch6.html>; Internet, chapter 6, 8

¹¹⁸ Ibid., chapter 6, 5

¹¹⁹ For more details on the structure and development of capabilities see Bundeswehr, *Das Heer-Raschere und wirksamere Reaktionsfähigkeit außerhalb Deutschlands* [Document on-line] (2001, accessed 28 January 2003); available from <http://www.ndu.edu/inss/mcnair60/m60ch6.html>; Internet.

¹²⁰ Chancellor Schroeder won the election in 2002 mainly because he stated not to support any war against Iraq; this statement was not directed against the U.S. It concentrated on the German population.

peace keeping environment, also due to improvisation. This has been used by political leaders as evidence for adequate army doctrine, equipment and training. Without a serious test in a minor conflict beyond peace keeping the army will not be able to effectively argue for further improvement.

Due to a lack of money, and in accordance with tradition, the military leadership has tried to transform the army from the inside. Education, training and doctrine have been renewed. The Chief of the Army Staff has revitalized the old tradition of exercising so-called "Führerreise" (commanders' journey). This is a map exercise for division commanders and commanders of higher level to test the doctrine and organization of forces.

Initiative and mission orientation remain unchanged in the center of all deliberations and planning. Invention of new technology is not seen as a general remedy. But the ability to plug into American forces will stimulate further transformation. Due to financial restrictions, only those technologies, which have proven to be fully developed, will find entrance into the army. No risks will be taken either by politicians or by military leaders.¹²¹

The ongoing transformation process of the German army is in accordance with the military tradition. The German doctrine emphasized in its fundamental document "Truppenführung (TF)" (Command and Control of Troops) especially leadership, command and initiative, as well as concentration of forces. Maneuver and mobility were regarded as decisive factors for the performance of forces. They constitute together with the principle of information superiority the core of the so-called general principles of command and control.¹²² Flexibility and orchestration of forces were not part of the principles of command and control. Orchestration of forces is the key feature of command and control in combat situations. Flexibility is a general demand for leaders at all levels and the force structure.¹²³

The aim of the present process of adaptation is not to have the newest technology but to find an

¹²¹ Robin F. Laird and Holger Mey, "The Revolution in Military Affairs," chapter 6, 8

¹²² *Truppenführung (TF) (Command and Control)*, The Federal Ministry of Defense, Bonn, December 2000, No 422, 429, 437, 439, 2335

¹²³ *Ibid.*, No 2314, 2312,

optimal mixture of modern equipment, doctrine, leadership, and training. But the financial restrictions endanger further successful change in the armed forces. Unclear political objectives with regard to the future role of Germany in Europe and the future importance of military means for German politics constitute a further barrier.¹²⁴ Minor military commitments are used by the political leadership to underline the direction of military change. This direction seems more to be dominated by the incentives the political leaders hope for than by military necessities and foreign politics.

Working Propositions for Army Transformation

The starting point of this monograph was to examine the influence of military history, especially minor wars, on the development of doctrine and its lessons for the transformation process. From institutional theory, and from the development of the “Blitzkrieg doctrine” in the interwar period, we learned that the direction of military transformation depends to a high degree on the interests of the leadership and their tendency to look for votes. The experience from minor military clashes such as the Japanese-Chinese War and the Spanish Civil War in the second half of the 1930’s have only limited value as confirmation of the already decided direction of the military change.

To understand the ongoing transformation process you have to identify the interests of the political and military leaders. The aim of the political executive of the only remaining superpower, the United States, is to enable a quick reaction – militarily and politically - on any threat at any place in the world to keep or restore peace. A military institution that needs a lot of time either to mobilize or to transport heavy equipment over long distances is not helpful in that regard. The longer the time to prepare for war and to conduct war, the more influence other national and international institutions, partners, and opponents will gain. In the government’s point of view, the ideal solution is armed forces able to be immediately deployed at any region and any time and to conduct a short and decisive battle.

¹²⁴ At present the political leaders have ordered to develop a political framework for the military change and to scrutinize the ongoing reform process. See Bundesregierung, *Deutsche Verteidigungspolitik – Die Bundeswehr* [Document on-line] (2001, accessed 28 January 2003); available from <http://www.bundesregierung.de/servlet/init.cms.layout>; Internet.

The interest of the military leaders of the Army is at least not to lose influence within the concert of the services. In accordance with the political preferences, only those services, which promise to serve the government best, will be adequately financed. This tendency can lead to sub-optimizing the joint armed forces by trying to optimize one single service.

Because it is problematic to correctly predict the nature of future warfare, recent minor military clashes have to be examined very carefully. There is no military activity not worth scrutinizing. There remains the need to identify the special conditions and the framework of every clash to draw the right conclusions. The real challenge is to balance the partial interests of political and military leaders. The prospect of individual power must not dominate the transformation process.¹²⁵

The development of doctrine in the inter-war era in Germany has further shown us that military transformation is more an evolutionary than a revolutionary process. To fully use the power of internal change, transformation must follow the tradition of the institution. Doctrine cannot be created in a vacuum. It is affected by the institutional culture and experience. This view is widely supported by the development and criticism of the 1976 *FM 100-5* in the US Army. One of the reasons the manual was not accepted in the Army was its departure in almost every way from its predecessors. As the nature of war has not changed and its decisive factors are still valid, this seems to be the most preferable option. For the US Army, this means further concentration on technological advance and on individual training and leadership.¹²⁶

Minor clashes must not only be carefully evaluated, the results have to be tested and validated in war games and high-level exercises. This minimizes the danger of subjectivity and selective perception. Minor clashes then may serve as milestones to check the direction of transformation. They should not

¹²⁵ The positive and negative effects of the influence of military leaders on the transformation process is widely discussed by Barry Watts and Williamson Murray, *Military Innovation in Peacetime*, ed. Williamson Murray and Allan R. Millet, *Military Innovation in the Interwar Period* (Cambridge: University Press, 1996)

¹²⁶ Richard M. Swain, *Filling the Void: The Operational Art and the U.S. Army*, ed. B.J.C. McKercher and M.A. Hennessy, *The Operational Art: Developments in the Theories of War* (Westport: Praeger Press, 1996), 148, 151: He provides a comprehensive background and criticism of the development of the 1976 FM 100-5 and its successors.

serve to guide the doctrine development in a completely new direction as the two examples from China and Spain have shown.

To validate the direction and speed of military change is of special importance as there is also a tendency of natural resistance to change within an organization. Strict hierarchic structures and loyalty towards the senior military leadership reinforce this tendency in military organizations. To balance this inherent inertia, external advice can be helpful. Independent specialists can assist in providing a vision of future warfare.¹²⁷ But since we have also learned that there can be a tremendous negative impact of external influence on transformation, this is a very problematic issue. The institution and its leadership must always have the feeling to direct and master transformation by themselves. The creation of an organizational element responsible only for transformation issues will become counter-productive. Innovation and transformation depend on bureaucratic acceptance within the respective organization.

The challenge for the military and political leadership is to create this institutional acceptance and to develop a transformation vision. The vision has to be balanced through operational realities. The latter must be derived from the national security strategy and must be tested with the conclusions from military commitments of the past. War games based on a hypothetical future scenario can verify the results. But here again we have to be cautious with war gaming. There is the same danger of misuse to support certain arguments and not to come to independent results.

The relationship between transformation and doctrine is of key interest. Here, first of all, a clear language and proper use of the terms doctrine and concept is imperative. As William J. Gregor showed there has been some confusion with regard to the use of these terms in the past. Doctrine is an expression belonging to near term operational planning and reflects existing capabilities. Concepts belong to force planning and deal with future capabilities.¹²⁸

¹²⁷ See the discussion about external elites in Colin S. Gray, "Thinking Asymmetrically in Times of Terror," *Parameters*, US Army War College Quarterly XXXII (Spring 2002): 13

¹²⁸ See the wide discussion by William J. Gregor, *The Relationship between Joint Doctrine Development and Service DTLOSM*

Doctrine in the U.S. understanding is narrowly interpreted and reflected in Field Manuals. According to Huba Wass de Czege "doctrine was full of description of what to do (methods) and what to consider (check list) but largely avoided principles, except of course for the ten Principles of War we all taught to memorize as a check list."¹²⁹ As a consequence of present definition, doctrine is not immediately related to the transformation process. It has to be adapted and changed with every new capability introduced in the Army.

In the future, doctrine should be understood as overarching principles that can also be applied to new situations and new capabilities. That was the understanding of the German "Blitzkrieg doctrine." It was the application of a well-known and agreed upon principle and the use of new technology. With such a broad interpretation of doctrine it could also provide a bridge to force planning. This approach could help to further develop a general understanding and common sense in the Army of how to fight and could help to effectively employ new capabilities in uncertain and unpredictable scenarios.¹³⁰

The impact of chance and the availability of the right leader at the right place at the right time cannot be underestimated. However chance is not a principle to rely upon in the transformation process of military forces. It is the foremost obligation of the military and political leadership to create a climate where critical thinking and the development of an independent personality are favored. Training and education have to be focused to create leaders at all levels able to act in a given framework in accordance with the local situation and applying overarching principles. That implies patience at the higher level of command and a culture of mutual trust and discipline. Military transformation is more than emerging technologies. It is also the soldier being able to use the advantage of new technologies to apply old principles. Technology is primarily only an enabler.

As far as the content or direction of military transformation is concerned, the study of the evolution of the "Blitzkrieg doctrine" has shown that there are general factors deciding the nature of warfare,

¹²⁹ Huba Wass de Czege, "On Keeping Ideas Ahead of Technology," 3

¹³⁰ Huba Wass de Czege, "On Keeping Ideas Ahead of Technology," 4

which have not changed substantially over a long period of time. This has also been supported by the interpretations of the Japanese-Chinese War and the Spanish Civil War.

Concentration of the effects of forces at the decisive point, maneuver and mobility of forces, flexibility, leadership and initiative, and orchestration and coordination of the various forces will continue to provide a general guideline for the future warfare. They provide the framework for doctrinal development within an evolutionary process. This does not mean that these are the only factors to be covered by future developments. They provide nothing more than a set of conditions to be necessarily fulfilled in every transformation process. One factor has to be especially emphasized for the future. The need to orchestrate and coordinate forces will become a dominant factor especially for Army transformation.

The Army of the future will to a high degree depend on the support of other services. Strategic transport, fire support, support with information as well as logistics will have great influence on the army's capabilities. The two-dimensional view of combat where the air force mainly is in a supporting role for ground operations has changed. In modern warfare the services are of equal importance. As a consequence the transformation process has to be closely coordinated or even linked with the other services.

A military organization has to be able to adapt to the environment. It has to keep up with the technological development. Military organizations can do best if transformation is perceived as an evolutionary process. This process has to be based on overarching principles. These principles can be identified and verified by military history. Defining transformation as a revolution is not based on proven and reliable principles. It implies the danger to repeatedly change the direction. The more the direction has been changed the greater the danger that members will lose their orientation. Minor military clashes may be used to check direction and speed of military change. They are not well suited but they are still the best of all ill-suited means.

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